

15 CONCLUSION

15.1 General

An EIA Report has been prepared for CKR to satisfy the requirements given in the EIA Study Brief ESB-156/2006 and the Technical Memorandum on Environmental Impact Assessment Process. All the latest design information has been incorporated into the EIA process. Aspects that have been considered in this EIA Report include:

- Consideration of alternative alignment options
- Project description and construction methodology
- Air Quality
- Noise
- Water Quality
- Waste Management
- Land Contamination
- Hazard
- Landscape and Visual
- Cultural Heritage
- Environmental Monitoring and Audit

All the existing and planned environmental sensitive receivers in the vicinity of the alignment have been identified by conducting site surveys and reviewing relevant planning information. The receivers identified include residential blocks, educational institutions, clinics and place of worship etc. These receivers have all been considered in this EIA study.

The key assessment assumptions, limitation of assessment methodologies and all related prior agreements with EPD on assessment of different environmental aspects are given in **Appendix 15.1**.

15.2 Alignment Evaluation

The proposed alignment of CKR has evolved through a number of studies, aimed at minimizing the land resumption/clearance and disruption to the public. A number of alignment options have been considered for the west, east and central portions. These options have been evaluated by considering a number of factors including engineering feasibility, construction difficulties, construction and maintenance costs, public comments, environmental factors etc.

The proposed CKR is now a dual 3-lane trunk road, mainly in the form of tunnel, beneath Kowloon Peninsula linking the West Kowloon Reclamation area in the west and the proposed Kai Tak Development area in the east. It will connect the West Kowloon Highway at Yau Ma Tei Interchange to the proposed Trunk Road T2 at Kai Tak Development and Tseung Kwan O – Lam Tin Tunnel to form a

strategic highway link Route 6 to serve the existing and planned developments in West Kowloon, East Kowloon and Tseung Kwan O.

15.3 Construction Method

Site-specific construction methodologies have been developed comprising different tunnelling methods, including cut-and-cover tunnel, drill-and-break tunnel, drill-and-blast tunnel and underwater tunnels. With reference to the longitudinal and geological profile of CKR, the cut-and-cover tunnels sections at both ends of the tunnel will involve excavation of soil (fill) materials using non-percussive method while the central portion of tunnel will be accomplished by the traditional drill-and-blast method within the strata of bedrock at more than 30 m below ground.

There are a number of bridges designed for the west portion connection roads to link up with CKR with West Kowloon Interchange and Lin Cheung Road. The bridge form is designed as continuous prestressed concrete box girder bridges which are matched with the existing highway structures. Since the bridge lengths are relatively short, conventional span-by-span construction method could provide more feasibility in fitting different alignment change of the bridges.

As the structural form of the elevated sections of the connection roads in the Kai Tak Development and Kowloon Bay area is to be designed as continuous prestressed concrete box girder bridges with relatively short span for the flexibility to suit different alignment changes and various interface constraints. Conventional cast in-situ span-by-span method is to be implemented for construction of these bridges.

Landscaped decks are designed to beautify the west and east end portals of CKR and existing Kowloon City Ferry Pier PTI which is generally following the vertical profile of CKR. The landscaped decks are mainly a reinforced concrete frame structure supporting on the cut-and-cover tunnel.

A number of government buildings and facilities may require decanting and demolishing. However, these decanting / reprovisioning proposals are subject to review / change in the detailed design stage. Construction of CKR cut-and-cover tunnel underneath the YMT Police Station New Wing Building may require removal of those affected piles. An underpinning scheme is required to transfer the existing column loadings to a deeper rock stratum.

The noise mitigation structures will be designed as steel frame structures with supporting posts. Acoustic panels will be fixed on the frame to provide sufficient sound insulation.

15.4 Air Quality Impact

An air quality impact assessment has been conducted for both construction and operational phases of CKR. The fugitive dust assessment for the construction has concluded that watering in all works area once per hour during working hours (7:00am – 7:00pm) would be required to control the fugitive dust impact. Potential dust impact would be generated from the site clearance, ground excavation, construction of the associated facilities and transportation of soil during the construction phase.

Quantitative fugitive dust assessments have been conducted, taking into account the cumulative impact caused by nearby concurrent projects. The result show that, in general, the predicted 1-hour and 24-hour and annual TSP concentrations at identified ASRs would comply with the respective criteria. Hence, it is concluded that there will not be any adverse residual air quality impacts during construction phase. Effective dust control can also be achieved by implementing the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation and in accordance with the EM&A programme during construction.

All the dredged sediment would be contained in geotextile as soon as practicable and transported away on a daily basis. This would minimize the possibility of exposing the dredged sediment and hence the possibility of any odour nuisance as well.

For the assessment of operational phase air quality, it is concluded that the predicted air quality impacts on all sensitive receivers would comply with Air Quality Objectives.

15.5 Noise Impact

Construction airborne noise assessment has been conducted. All practicable mitigation measures have been exhausted to minimise the noise impacts. These mitigation measures include the optimisation of construction methodology (i.e. schedule of using PME), quiet plant, temporary noise barrier and good site practices. However, given the site constraints, some of the receivers (See **Table 5.14**) would still be subject to the exceedance of the construction noise criterion.

The exceedance of the construction noise criterion have been assessed and considered the impacts are temporary and reversible. With all the proposed mitigation measures, the adverse residual impact exceeding the construction noise criterion has been reduced to be minimal.

Construction groundborne noise assessment has also been conducted. No exceedance of noise criteria is predicted and hence no mitigation measures are required.

For the operational phase, mitigation measures with low noise road surface, noise barrier, semi-enclosure and full enclosure are required to fulfill the EIAO criteria. The layout of noise sensitive uses, e.g. planned schools in Kai Tak Development Area may be arranged in a way to avoid the sensitive facades of the classrooms facing Project Roads to avoid unacceptable traffic noise impacts from the surrounding road network.

Maximum allowable sound power levels allowed to be emitted from louvers of fixed noise sources at ventilation buildings at West Portion, Central Portion and East Portion were predicted. The re-provisioned Kowloon City Ferry Pier Public Transport Interchange (PTI) will also designed to no direct line-of-sight of the noise sources at the noise sensitive uses. With the proper selection of plant and adoption of noise control measure such as acoustic silencers, noise barriers, acoustic louvers, the NSRs located in the vicinity of these fixed noise sources would not be affected.

15.6 Water Quality Impact

Potential water pollution sources have been identified as construction runoff, sewage from site workforce, groundwater contamination and sediment and contaminant release due to dredging for temporary fairway for marine vessels. Mitigation measures including covering excavated materials and providing sedimentation tanks on-site etc. are recommended to mitigate any adverse water quality impacts. To minimise the potential impact due to SS during sediment dredging, deployment of silt curtains around the closed grab dredgers is recommended for the dredging works to minimize any significant water quality impact in the Victoria Harbour.

The operational water quality impact for road run-off, wastewater discharge during maintenance of ventilation and air purification system will have no adverse water quality impact with the incorporation of mitigation measures in the design.

In order to ensure effectiveness of the implemented mitigation, regular water quality monitoring in the Kowloon Bay are recommended during the construction phase.

15.7 Waste Management Implications

The quantity and timing for the generation of waste during the construction phase have been estimated. Measures, including the opportunity for on-site sorting, reusing excavated fill materials (stored in stockpiles) etc, are devised in the construction methodology where practicable to minimise the surplus materials to be disposed. The annual disposal quantities for C&D materials and their disposal methods have also been discussed making reference to the C&DMMP which has endorsed by PFC. The Project Proponent will ensure all the mitigation measures mentioned in the C&DMMP will be complied with. Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public filling areas or reclamation sites. The surplus C&D material would be reused within the site as much as possible.

In addition, quantities of contaminated soil and dredged/ excavated sediment that would be generated during the construction phase have also been estimated. Measures for handling these materials have been discussed. The types and quantities of waste that would be generated during the operational phase have also been assessed. Recommendations have been made to ensure proper treatment and disposal of these wastes.

No dredging works is allowed to proceed until all issues on management of dredged sediments have been resolved and all relevant arrangements have been endorsed by the relevant authorities including MFC and EPD. Exact location of marine disposal of the sediment will be assigned by MFC.

The total volume (in-situ) of disposal sediment is 218,894m³ and the quantity of sediment that required Type 3 – Special Treatment/Disposal is 58,893m³.

15.8 Land Contamination Impact

A land contamination assessment has been conducted. Background information including geological conditions and selected aerial photos has been reviewed and

site survey has been conducted to identify the potentially contaminated sites along the proposed CKR alignment.

The available soil and groundwater testing results indicate that no RBRGs exceedances except 3 soil samples in which concentrations of lead or PCBs were found to have exceeded the RBRGs limits for “Urban Residential” and “Rural Residential” landuse, but not the RBRG level for “Public Park”, which is the more representative after-use for CKR upon completion. Nevertheless, a confirmatory investigation is proposed in the CAR/RAP in order to confirm the extent of the contamination identified.

Details of the confirmatory investigation were documented in the Supplementary CAP which also addressed the land contamination concerns in the additional works areas. A Supplementary CAR/RAP has been prepared to provide an update on the potential land contamination extent and remediation options.

15.9 Hazard Assessment

A quantitative risk assessment was undertaken to evaluate the hazard to life issues associated with the transport and use of explosives during construction of the CKR. The risk assessment pertains to individual and societal risks criteria stipulated in Annex 4 of the Environmental Impact Assessment Ordinance Technical Memorandum (EIAO-TM).

Potential causes of hazard events have been identified and a set of relevant scenarios have been developed.

The assessment results indicate the risk is acceptable in terms of individual risk and societal risk. It is concluded that the risk associated with the transport and use of explosives for the CKR project satisfies the Hong Kong Government Risk Criteria set out in Annex 4 of the TM-EIAO. Hence, the hazard to life impact due to the construction and operation of the CKR project is considered acceptable.

During the design development of the Project, the originally proposed fresh air supply ventilation building at the junction of To Kwa Wan Road and San Ma Tau Street has been deleted. Therefore the assessment on the possibility of released town gas being drawn into the CKR tunnel under the conditions of the EIA Study Brief, is not required.

15.10 Landscape and Visual Impact

As the majority of the CKR is underground, landscape and visual impacts would be restricted to above ground construction works and operational facilities only. It is considered there will be no substantial adverse landscape and visual impacts to the surrounding sensitive receivers during the operation phase.

Based on the 2010 Tree Survey, about 1304 trees will be affected by the works and need to be removed by felling or transplanting, while approximately 2800 will be retained. The 2010 Tree Survey estimated approximately 163 trees would be suitable for transplanting and approximately 1141 trees will not be suitable for transplanting and would therefore require felling. Due to the Project re-alignment and other projects development (e.g. XRL), the number of trees affected by the CKR Project has reduced since the 2010 Tree Survey. An updated Tree Survey

will be carried out (due to commence mid 2013) and tree treatments will only be finalised during the Tree Removal Application.

For trees unavoidably affected by the Project that have to be removed, where practical, transplantation will be chosen as the top priority method of removal but if this is not possible or practical (e.g. the tree is too large or has a low survival rate), compensatory planting will be provided for trees unavoidably felled. The felled trees will be compensated for mainly within the Project Boundary including on the future landscape deck near the western tunnel portal but it is likely that it will be necessary to agree additional receptor sites for some compensatory trees (and possibly transplanted trees). Using worst case scenario numbers, current estimates predict additional receptor sites will be required for approximately 550 trees but given the reduced numbers of trees now affected by the Project, particularly in the West Portion, this number is likely to be reduced.

No Registered Old and Valuable Trees are located within the Works Area and none of these affected trees are LCSD champion Trees or Registered Old and Valuable Trees, neither are they rare or endangered species, but mainly common exotic trees. All the trees with high amenity values that are unavoidably affected by the works would be transplanted where possible. Detailed tree preservation, transplanting and felling including compensatory planting proposals will be submitted to the relevant Government Department for approval in due course in accordance with ETWB TC no. 3/2006.

Part of the public open spaces within the works area will be permanently taken by connection road, tunnel portal, ventilation building or re-provisioned community facilities, particularly in the West Portion. All areas of public open space affected by the Project will be re-provisioned either at the same location following the completion of temporary works, or at a separate site, as agreed with relevant Government departments and under the proposed development. Overall more public open space will be re-provisioned/ reinstated than is taken during construction providing a net benefit to the regional environment.

A number of LRs in the East Portion are also considered to benefit from the Project once mitigation measures have been implemented. These include Roadside Planting along San Ma Tau Street and Bus Terminus (LR3.3a), Disturbed Area within former Kai Tak Airport (LR3.5a), Man-made Shoreline around former Kai Tak Airport (LR3.8b) as well as the Man-made Shoreline of West Kowloon Bay (LR3.8a).

Impact on Landscape Character Areas (LCAs) during construction would be primarily due to construction activities including associated temporary works for the construction of cut-and-cover tunnel, temporary reclamation, ventilation and administration buildings and connecting roads. After implementation of mitigation measures, there would be moderate adverse residual impacts on the Transport Corridor Landscape (LCA1.1) in the West Portion and the Typhoon Shelter (LCA3.4) and Transportation Corridor Landscape (LCA3.5) in the East Portion during construction. The rest of the LCAs would experience slight or insignificant adverse residual impacts at this stage. With the implementation of mitigation measures, at the design year (operation year 10), impacts from the Project on all the LCAs would be insignificant.

Visual impact during the construction phase would be primarily due to construction activities such as excavation for cut and fill, temporary reclamation, piling and demolition of existing buildings as well as actual construction of new structures such as the ventilation and administration buildings, depressed and connecting roads and tunnel portals including landscape deck. With implementation of mitigation measures during construction, there would still be some substantial impacts on VSRs adjacent or close to the CKR especially residential and GIC VSRs while residual impacts on VSRs further away from the works would be moderate to slight adverse except for those who will be shielded from the view by future development in the former Kai Tak Airport area and not be affected by the Project. After the implementation of mitigation measures in operation year 10, visual impacts on all VSRs will be insignificant with the exception of some slight adverse visual impacts on residential and GIC VSRs that are close to the tunnel portal in the West Portion.

Considerable effort has been made to integrate the CKR with KTD and overall the former Kai Tak Airport area will be enhanced. A number of CKR VSRs close to the Ma Tau Kok waterfront, which will be converted into a landscaped promenade, will also slightly benefit from the CKR Project, while viewers along the current and future waterfront here will benefit moderately.

Overall, it is considered that the adverse residual landscape and visual impacts of the proposed Project are considered as acceptable with mitigation measures during construction and operation phase.

15.11 Impact on Cultural Heritage (Terrestrial & Marine Archaeology)

The findings of the terrestrial archaeology baseline study indicated that the impacted areas are of no or very low archaeological potential. As no adverse impacts are expected to arise from both the construction and operational phase of the project, no mitigation measures will be required. As a precautionary measure, the Antiquities and Monuments Office should be informed immediately in case of discovery of antiquities or supposed antiquities during the construction.

The Marine Archaeological Investigation (MAI) was completed in two phases (The first in 2008 and the second in 2012). The Baseline Review established high marine archaeological potential for Kowloon Bay. The 2008 geophysical survey located 8 unknown seabed objects. Diver inspection of them identified them as modern dumped debris. The 2012 geophysical survey located 36 unknown seabed objects. Diver inspection of 28 of them identified them as modern debris with no archaeological value. The eight objects that were not practicable to inspect were deemed to have low archaeological potential due to their location underneath the disused fuel dolphin which is a current work site creating debris.

A watching brief is not required. However, contractor should be alerted during the construction on the possibility of locating archaeological remains, such as cannon and AMO shall be informed immediately in case of discovery of antiquities or supposed antiquities in the subject sites. No additional mitigation is required.

15.12 Impact on Cultural Heritage (Built Heritage)

A built heritage survey has been conducted and a total of 18 built heritage resources have been identified in the vicinity of the study area. Several buildings and structures will require mitigation, including Yau Ma Tei Police Station, Tin Hau Temple, Kowloon Methodist Church, Ma Tau Kok Animal Quarantine Depot, Kowloon City Ferry Pier and Air raid precaution tunnels of the K1 and K1A Networks. The construction and operation of the tunnel and road network will not cause any insurmountable impacts if the proposed mitigation measures are implemented properly.

15.13 Environmental Monitoring and Audit Requirements

It is recommended to implement an EM&A programme throughout the entire construction period to regularly monitor the environmental impacts on the neighbouring sensitive receivers. All the requirements (including dust, airborne noise, water quality, waste, land contamination, hazard, landscape & visual, and cultural heritage) in the EM&A Manual shall be complied with.

An Environmental Mitigation Implementation Schedule has also been included in the EM&A Manual to summarise all the measures, the implementation location, time frame, agency etc.

15.14 Overall

The EIA has been conducted based on the best and latest available information during the course of the EIA study. The findings of this EIA have provided information on the nature and extent of environmental impacts arising from construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.

This EIA has demonstrated general compliance with the environmental standards and legislation with the implementation of the proposed mitigation measures during the construction and operational phases. This EIA has also demonstrated general acceptability of the adverse residual impacts and thus the population and environmentally sensitive receivers in the vicinity of the site would be sufficiently protected. Environmental monitoring and audit mechanisms have been recommended for the construction of the Project, where necessary, to verify the effectiveness of the recommended mitigation measures. A summary of the environmental impacts associated with the Project is presented in **Table 15.1**.

Table 15.1 Summary of Environmental Impacts Associated with the Project

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<u>Air Quality Impact</u>					
<i>Construction Phase</i>					
Existing residential, premises, educational, industrial, clinic/ home for the aged, worship, government, institution and community (GIC) and Recreational/ Parks in West Kowloon area, Ho Man Tin, Kai Tak and Kwai Tsing. Future residential premises and GIC in West Kowloon area, and Ho Man Tin. 56 assessment points (refer to Figures 4.1.1-4.1.4)	<ul style="list-style-type: none"> • 1-hour Average TSP Conc.: 102 – 6095 µg/m³ • 24-hour Average TSP Conc.: 70 – 913 µg/m³ • Annual Average TSP Conc.: 68.4 – 91.9 µg/m³ 	<ul style="list-style-type: none"> • EIAO-TM and AQO • 1-hr Average TSP Conc: 500 µg/m³ • 24-hr Average TSP Conc: 260 µg/m³ • Annual Average TSP Conc: 80 µg/m³ 	<ul style="list-style-type: none"> • Exceed EIAO-TM (1-hr) criterion by up to 5595 µg/m³ • Exceed AQO (24-hr) criterion by up to 653 µg/m³ • Exceed AQO (Annual) criterion by up to 11.9 µg/m³ 	<ul style="list-style-type: none"> • Watering once per hour on the active works areas, exposed area; and paved haul roads to reduce dust emission • Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices would be carried out to further minimise construction dust impact. 	<ul style="list-style-type: none"> • Adverse residual impacts not anticipated.
<i>Operational Phase</i>					
Existing residential, premises, educational, industrial, clinic/ home for the aged, worship, GIC and Recreational/ Parks in West	NO ₂ <ul style="list-style-type: none"> • 1-hour Average NO₂ Conc.: 245 – 286 µg/m³ • 24-hour Average NO₂ 	<ul style="list-style-type: none"> • AQO • 1-hr Average NO₂ Conc: 300 µg/m³ • 24-hr Average NO₂ 	<ul style="list-style-type: none"> • No exceedances are predicted at all ASRs. 	<ul style="list-style-type: none"> • Air purification system (APS) is proposed to adopt to remove the pollutant concentrations before releasing to 	<ul style="list-style-type: none"> • Adverse residual impacts not anticipated.

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<p>Kowloon area, Ho Man Tin and Kai Tak.</p> <p>Future residential premise, educational, hospital, worship, GIC, CDA and Recreational/ Parks in West Kowloon area, Ho Man Tin and Kai Tak.</p> <p>79 assessment points (refer to Figures 4.6.1-4.6.3)</p>	<p>Conc.: 83 – 132 µg/m³</p> <ul style="list-style-type: none"> Annual Average NO₂ Conc.: 32.8 – 65.2 µg/m³ 24-hour Average RSP Conc.: 106 – 114 µg/m³ Annual Average RSP Conc.: 39.9 – 43.8 µg/m³ 	<p>Conc: 150 µg/m³</p> <ul style="list-style-type: none"> Annual Average NO₂ Conc: 80 µg/m³ 24-hr Average RSP Conc: 180 µg/m³ Annual Average RSP Conc: 55 µg/m³ 		<p>atmosphere via the three ventilation buildings.</p> <ul style="list-style-type: none"> No mitigation measures are proposed as the predicted max. NO₂ and RSP concentrations are all within the respective criteria. 	
<u>Airborne Noise</u>					
<i>Construction Phase</i>					
<p>Existing residential premises and educational institutions near West Portion, Central Portion and East Portion of CKR.</p> <p>Future residential premises near West Portion and Central Portion of CKR.</p> <p>42 assessment points (refer</p>	<ul style="list-style-type: none"> Without mitigation measures, the predicted project alone noise levels would range from 65 to 95 dB(A). Most of the sensitive receivers will be higher than 80 dB(A). Around 12 sensitive receivers will be greater than or equal to 90 dB(A). 	<ul style="list-style-type: none"> EIAO-TM Annex 5 for non-restricted hours for domestic premises: 75 dB(A), for educational institution is 70 dB(A) (65 dB(A) during examination period). 	<ul style="list-style-type: none"> Exceed the EIAO-TM noise criterion by up to 20 dB(A) for residential and 27 dB(A) for educational institution 	<ul style="list-style-type: none"> Adoption of good site practices, optimisation of construction methodology, quieter plant, temporary movable noise barriers enclosure and acoustic mat to minimise construction noise impact 	<ul style="list-style-type: none"> The mitigated predicted project alone noise levels would range from 51 to 82 dB(A). The exceedance of 1-7 dB(A) for 1-39 months due to construction of the Project alone. Most of the sensitive

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
to Figures 5.1.1-5.3.2)					<p>receiver will comply the noise criteria, 6 sensitive receivers will greater than or equal to 80 dB(A).</p> <ul style="list-style-type: none"> • Exceedance in cumulative impact of 1-4 dB(A) at NSRs (E-N15 and E-N11) induced from KTD. • It is considered that all practicable measures have been exhausted to minimise the adverse residual impact.
<i>Operational Phase (Traffic Noise)</i>					
<p>Existing residential premises, schools, clinics, temple near West Portion and East Portion of CKR.</p> <p>63 assessment points (refer to Figures 5.1.1-5.3.2)</p>	<ul style="list-style-type: none"> • Without noise mitigation measures, the predicted noise levels would be in the range of 46 to 84 dB(A); • The noise contribution from Project Roads would be up to 25.6 dB(A). 	<ul style="list-style-type: none"> • EIAO-TM Annex 5 	<ul style="list-style-type: none"> • Exceed the EIAO-TM noise criterion by up to 26 dB(A) 	<ul style="list-style-type: none"> • Implementation of low noise road surfacing, vertical noise barrier, cantilevered section noise barrier, semi-enclosure and full enclosure before the operational stage. 	<ul style="list-style-type: none"> • Some of the noise sensitive receivers will exceed the noise criteria, however, the noise contribution from Project Roads is less than 1.0 dB(A).

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<i>Operational Phase (Fixed Noise)</i>					
Existing and planned residential premises and temple in West Portion, Central Portion and East Portion of CKR 13 assessment points (refer to Figures 5.1.1-5.3.2)	<ul style="list-style-type: none"> Maximum allowable sound power level of the fixed plant was predicted to meet the relevant noise criteria 	<ul style="list-style-type: none"> EIAO-TM Annex 5: ANL-5dB(A) or prevailing noise level 	<ul style="list-style-type: none"> No exceedance is anticipated. 	<ul style="list-style-type: none"> Louvers should be orientated away from adjacent NSRs, preferably onto main roads which are less sensitive. Direct noise mitigation measures including silencers and acoustic louvers should be allowed for in the design for the ventilation buildings. The louvers of these ventilation buildings should have adequate sound insulation properties to minimise the noise emanating through the building fabric. 	<ul style="list-style-type: none"> No adverse residual impacts would be anticipated.
<u>Groundborne Noise</u>					
<i>Construction Phase</i>					
Existing residential premises and school along	<ul style="list-style-type: none"> Daytime 	<ul style="list-style-type: none"> TM-Places 	<ul style="list-style-type: none"> No exceedance was 	<ul style="list-style-type: none"> Mitigation measure is 	<ul style="list-style-type: none"> Adverse residual impact is not

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proposed CKR alignment. 7 assessment points (refer to Figure 5.1.1-5.3.2)	<ul style="list-style-type: none"> <20-46 dB(A) 	<ul style="list-style-type: none"> Daytime: 65 dB(A) for residential premises; 60 dB(A) for education institutions and 55 dB(A) for education institutions during examination period 	predicted.	not required.	anticipated.
<u>Water Quality</u>					
<i>Construction Phase</i>					
Tai Wan Salt Water Intake (WSR 1), Planned Kai Tak Cooling Water Intake (WSR 2) and To Kwa Wan Typhoon Shelter (WSR 3)	<u>SS Elevation</u> <ul style="list-style-type: none"> There would be exceedances of SS elevations at WSR 2 and WSR 3 during dredging works of CKR alone (Scenario C3) at wet season. There would be exceedances of SS elevations at WSR 2 and WSR 3 during dredging works of CKR project and other projects including Trunk Road T2 (Scenario C4) at wet 	<ul style="list-style-type: none"> TM-EIAO; Water Pollution Control Ordinance (WPCO) (Cap. 358); Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS); Practice Note for Professional Persons (ProPECC) PN 1/94 	<u>SS Elevation</u> <ul style="list-style-type: none"> The percentage of exceedance time is less than 12%, i.e. about 8 days for the 2-month dredging period when considering CKR alone. The percentage of exceedance time would be 12% of whole dredging period when considering CKR project and other 	<ul style="list-style-type: none"> Install efficient silt curtains at the point of dredging/filling to control the dispersion of SS. Water quality monitoring should be implemented to ensure effective control of water pollution The decent speed of grabs should be controlled to minimize the seabed impact and to reduce the volume of over-dredging; In dry season, the 	<ul style="list-style-type: none"> Exceedance due to Cu and total PAH levels were predicted in bottom layer of WSR 3 (To Kwa Wan Typhoon Shelter) according to Australian Water Quality Guidelines for Fresh and Marine Waters. However, these criteria are for protection of irrigation / aquaculture and fresh water aquatic ecosystem. While WSR 3 is a typhoon shelter only without any ecological

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	<p>season.</p> <p><u>Release of Contaminants</u></p> <ul style="list-style-type: none"> Exceedance of Cu and total PAH were predicted at WSR 3 (To Kwa Wan Typhoon Shelter) during dredging works of CKR alone (Scenario C3) at dry season Exceedance of Cu and total PAH were predicted at WSR 2 (Planned Kai Tak Cooling Water Intake) and WSR 3 (To Kwa Wan Typhoon Shelter) during dredging works of CKR project and other projects including Truck Road T2 (Scenario C4) at dry season. 		<p>concurrent projects including Truck Road T2.</p> <p><u>Release of Contaminants</u></p> <ul style="list-style-type: none"> Marginal exceedance of copper and total PAH levels was predicted. 	<p>dredging rate by closed grab dredgers for temporary marine channel outside pipepile wall shall be less than 1500m³/day and 125 m³/hour if no concurrent projects.</p> <ul style="list-style-type: none"> In all other scenario, the dredging rate shall be less than 750m³/day and 62.5 m³/hour Dredging works shall be only for the provision marine channel. No dredging work is required for temporary reclamation; The workfront of temporary reclamation shall be surrounded by cofferdams and the associated excavation and backfilling works for temporary reclamation shall have no contact with seawater. Additional silt screen to 	<p>importance and portable use, such exceedance will not deteriorate the existing functions of WSR 3.</p> <ul style="list-style-type: none"> The impacts are reversible once the 2 months dredging works is completed. In order to ensure effectiveness of the implemented mitigation, regular water quality monitoring in Kowloon Bay and its vicinity are recommended

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				the cooling water intake shall be provided to WSR 2. • Regular water quality monitoring in the Kowloon Bay and its vicinity are recommended during the construction phase to monitoring the level of SS and copper.	
<i>Operational Phase</i>					
Victoria Harbour Water Control Zone	Water quality would be deteriorated by: • road runoff discharge for viaduct/at-grade sections; • wastewater discharge from APS	• Relevant standards/criteria stipulated under the EIAO-TM, WPCO, TM-DDS and ProPECC 5/93	• N/A	• Appropriate and practicable mitigation measures have been proposed to control runoff from road runoff and wastewater discharge from APS (see Section 6.9.3)	• No unacceptable water quality impacts would be anticipated.
Waste					
<i>Construction Phase</i>					
Water quality, air and noise sensitive receivers at or near	• Inert C&D Materials from construction and	• EIAO-TM Annex 7 and	• Not applicable.	• Standard formwork or pre-fabrication should be	• No residual impacts

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<p>the Project Site, the waste transportation routes and the waste disposal site.</p>	<p>excavation works with a total volume of approximately 3,444,643 m3.</p> <ul style="list-style-type: none"> • 14,000m3 (in-situ) of non-inert C&D material. • General refuse from workforce per day would be estimated once the number of workforce becomes available. • Chemical waste from equipment cleansing and maintenance activities 	<p>Annex 15</p> <ul style="list-style-type: none"> • Waste Disposal Ordinance (Cap. 354); • Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C); • Land (Miscellaneous Provisions) Ordinance (Cap. 28); • Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation; • Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N); and • Dumping at Sea Ordinance (Cap. 466). 		<p>used as much as possible in order to minimise the arising of C&D materials. Any C&D materials generated would be reused (i.e. within the site and other concurrent projects) as far as practicable</p>	<p>would be anticipated.</p>

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<i>Operational Phase</i>					
Water quality, air and noise sensitive receivers at or near the Project Site, the waste transportation routes and the waste disposal site.	<ul style="list-style-type: none"> Insignificant amount of general refuse, industrial waste and chemical wastes to be generated from the administration building and ventilation buildings. 	<ul style="list-style-type: none"> Waste Disposal Ordinance (Cap. 354); and Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Employ reputable waste collector to remove general refuse and industrial wastes from the stations on a daily basis. Follow Code of Practice on the Packaging, Labelling and Storage of Chemical Waste in handling of chemical waste. Employ licensed waste collector and trip-ticket system for the collection of chemical waste. 	<ul style="list-style-type: none"> No residual impacts would be anticipated.
<u>Land Contamination</u>					
<i>Construction Phase</i>					
Potential land contamination sites within the Project Area	<ul style="list-style-type: none"> 157m³ of contaminated soil is anticipated to be generated from the Project. 	<ul style="list-style-type: none"> Section 3 (Potential Contaminated Land Issues) of Annex 19 "Guidelines for 	<ul style="list-style-type: none"> The 157m³ of soil exceeded the RBRG PCBs limit for "Urban Residential" 	<ul style="list-style-type: none"> Considering the minor quantity involved, on-site reuse of the contaminated soil is recommended. 	<ul style="list-style-type: none"> No adverse residual impacts would be anticipated.

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		<p>Assessment of Impact on Sites of Cultural Heritage and Other Impacts” of the EIAO-TM.</p> <ul style="list-style-type: none"> • Guidance Note for Contaminated Land Assessment and Remediation” • Practice Guide for Investigation and Remediation of Contaminated Land • Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management 	and “Rural Residential”.		
<i>Operational Phase</i>					
Not Applicable	Not Applicable	• Not Applicable	• Not Applicable	• Not Applicable	• Not Applicable

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<u>Hazard</u>					
<i>Construction Phase</i>					
Future population in vicinity of the transportation routes of explosives and the Project Sites requiring use of explosives.	<ul style="list-style-type: none"> The risk levels of transport and use of explosives during construction phase of the Project to the future population are considered “acceptable” according to the risk guidelines and no adverse impact is expected. 	<ul style="list-style-type: none"> EIAO-TM Annex 4 and Annex 22 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> In the EIA report, a list of recommendations was proposed for safe transport and use of explosives as “Good Practices” to further reduce the risk. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.
<i>Operational Phase</i>					
<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable
<u>Landscape and Visual</u>					
<i>Construction Phase</i>					
<ul style="list-style-type: none"> Landscape Resources (LRs) and Landscape Character Area (LCAs) within the Study Area Visually Sensitive 	<ul style="list-style-type: none"> Substantial to insubstantial significance on LR within the Study Area Moderate to insubstantial 	<ul style="list-style-type: none"> EIAO – TM, EIAO GN No.8/2010 ETWB TC(W) No. 3/2006 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> MM1 – Detailed Design - Landscape MM2 – Detailed Design - Visual 	<ul style="list-style-type: none"> Moderate adverse to insubstantial significance on LR within the Study Area Moderate adverse to

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Receivers (VSRs) within the Primary Zone of Visual Influence	<p>significance on LCAs within the Study Area</p> <ul style="list-style-type: none"> Substantial to slight significance on VSRs within the Primary Zone of Visual Influence 	<ul style="list-style-type: none"> ETWB TCW No. 8/2005 (submission is required to ArchSD for approval of the design of ventilation and administration buildings) Guidelines for Tree Risk Management and Assessment Arrangement on an Area Basis and on a Tree Basis' (Jan 2011), GLTMS, DevB Guidelines on Greening of Noise Barriers, (Apr 2012), GLTMS, DevB DEVB TCW No. 2/2013 – Greening on Footbridges and Flyovers; Submission is required to ACABAS for approval of any bridges and associated structures within the public highway system 		<ul style="list-style-type: none"> MM3 – Good Site Management. MM4 – Screen Hoarding MM5 – Lighting Control during Construction MM6 – Erosion Control MM7 – Topsoil reuse MM8 – Tree Protection & Preservation MM9 – Tree Transplantation MM10 – Compensatory Planting MM11 – Screen planting MM12 – Green Roof MM13 – Reinstatement MM14 – Reprovising of Public Open Space MM15 – Landscape enhancement 	<p>insubstantial significance on LCAs within the Study Area</p> <ul style="list-style-type: none"> Substantial to slight significance on VSRs within the Primary Zone of Visual Influence

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<i>Operational Phase</i>					
<ul style="list-style-type: none"> Landscape Resources (LRs) and Landscape Character Area (LCAs) within the Study Area Visually Sensitive Receivers (VSRs) within the Primary Zone of Visual Influence 	<ul style="list-style-type: none"> Substantial to insubstantial significance on LR within the Study Area Slight to insubstantial significance on LCAs within the Study Area Moderate to slight significance on VSRs within the Primary Zone of Visual Influence 	<ul style="list-style-type: none"> EIAO – TM, EIAO GN No.8/2010 ETWB TC(W) No. 3/2006 ETWB TC(W) No. 2/2004 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> MM1 – Detailed Design - Landscape MM9 – Tree Transplantation MM10 – Compensatory Planting MM11 – Screen planting MM12 – Green Roof MM13 – Reinstatement MM14 – Re-provisioning of Public Open Space MM15 – Landscape enhancement MM16 – Lighting Control during Operation 	<ul style="list-style-type: none"> Moderate adverse to insubstantial to slight beneficial significance on LR within the Study Area in Year 10 of operation Slight to insubstantial significance on LCAs within the Study Area in Year 10 of operation Slight to insubstantial significance on VSRs within the Primary Zone of Visual Influence in Year 10 of operation

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<u>Cultural Heritage</u>					
<i>Construction Phase</i>					
Sites of Archaeological Interest (Terrestrial Archaeology)	<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment EIAO-TM Annex 10 and Annex 19 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> No mitigation required; AMO should be informed immediately in case of discovery of antiquities or supposed antiquities during the construction. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.
Sites of Archaeological Interest (Marine Archaeology)	<ul style="list-style-type: none"> There are no marine archaeological resources that will be impacted. 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment EIAO-TM Annex 10 and Annex 19 Guidelines for Marine Archaeological Investigation 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> None required for the Marine Archaeology; Contractor should be alerted during the construction on the possibility of locating archaeological remains, such as cannon and AMO shall be informed immediately in case of discovery of antiquities or supposed antiquities in the subject sites. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.
Built Heritage	<ul style="list-style-type: none"> Built heritage resources may be impacted by 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Monitoring of vibration levels will be undertaken 	<ul style="list-style-type: none"> No adverse residual

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	<p>ground borne vibration</p> <ul style="list-style-type: none"> The Yau Ma Tei Police Station may be impacted by construction works in close proximity 	<p>Assessment</p> <ul style="list-style-type: none"> EIAO-TM Annex 10 and Annex 19 AMO Proposed Vibration Limits 		<p>during the construction phase and the Alert, Alarm and Action (AAA) vibration limit will be set at 3/4/5 mm/s and (for Grade 1 Historic Buildings)</p> <ul style="list-style-type: none"> 5/6/7.5 mm/s (for Grade 2 & 3 Historic Buildings) For the Yau Ma Tei Police Station (New Wing) an underpinning scheme will be implemented; Protective covering for building exterior and buffer zone will be maintained during construction works; For the Yau Ma Tei Police Station (Old Wing) a diaphragm wall construction method used to reduce settlement and a grout curtain wall will be installed in front of the building to absorb vibration. 	<p>impacts anticipated.</p>

Sensitive Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<i>Operational Phase</i>					
Sites of Archaeological Interest (Terrestrial Archaeology)	<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment EIAO-TM Annex 10 and Annex 19 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> No mitigation required. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.
Sites of Archaeological Interest (Marine Archaeology)	<ul style="list-style-type: none"> There are no marine archaeological resources that will be impacted. 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment EIAO-TM Annex 10 and Annex 19 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> None required for the Marine Archaeology. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.
Built Heritage	<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment EIAO-TM Annex 10 and Annex 19 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> No mitigation required. 	<ul style="list-style-type: none"> No adverse residual impacts anticipated.